

CLAIM AMENDMENTS

This listing of claims will replace all prior versions, and listings, of claims in the present application:

Claim 1 (Cancelled).

Claims 2-7 (Cancelled).

8. (Previously Presented) A process for producing an unsaturated carboxylic acid which comprises subjecting an alkane, or a mixture of an alkane and an alkene, to a vapor phase catalytic oxidation reaction in the presence of an orthorhombic phase mixed metal oxide catalyst, produced by a process comprising:

(a) admixing compounds of elements A, V, N and X and at least one solvent to form a solution,

wherein A is at least one element selected from the group consisting of Mo and W, N is at least one element selected from the group consisting of Te, Se and Sb, and X is at least one element selected from the group consisting of Nb, Ta, Ti, Al, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pt, Bi, B, In, Ce, As, Ge, Sn, Li, Na, K, Rb, Cs, Fr, Be, Mg, Ca, Sr, Ba, Ra, Hf, Pb, P, Pm, Eu, Gd, Dy, Ho, Er, Tm, Yb, Lu, Au, Ag, Re, Pr, Zn, Ga, Pd, Ir, Nd, Y, Sm, Tb, Br, Cu and Sc,

wherein A, V, N and X are present in such amounts that the atomic ratio of A : V : N : X is a : b : c : d, and

wherein, when a = 1, b = 0.01 to 1, c = 0.01 to 1 and d = 0.01 to 1;

(b) admixing a seeding effective amount of an orthorhombic phase mixed metal oxide seed, substantially free of hexagonal phase mixed metal oxide, with said solution to form a seeded solution,

- (c) removing said at least one solvent from said seeded solution to form a catalyst precursor; and
calcining said catalyst precursor to obtain said orthorhombic phase mixed metal oxide catalyst.

9. (Previously Presented) A process for producing an unsaturated nitrile which comprises subjecting an alkane, or a mixture of an alkane and an alkene, and ammonia to a vapor phase catalytic oxidation reaction in the presence of an orthorhombic phase mixed metal oxide catalyst, produced by a comprising:

- (a) admixing compounds of elements A, V, N and X and at least one solvent to form a solution,

wherein A is at least one element selected from the group consisting of Mo and W, N is at least one element selected from the group consisting of Te and Se, and X is at least one element selected from the group consisting of Nb, Ta, Ti, Al, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pt, Bi, B, In, Ce, As, Ge, Sn, Li, Na, K, Rb, Cs, Fr, Be, Mg, Ca, Sr, Ba, Ra, Hf, Pb, P, Pm, Eu, Gd, Dy, Ho, Er, Tm, Yb, Lu, Au, Ag, Re, Pr, Zn, Ga, Pd, Ir, Nd, Y, Sm, Tb, Br, Cu and Sc,

wherein A, V, N and X are present in such amounts that the atomic ratio of A : V : N : X is a : b : c : d, and

wherein, when a = 1, b = 0.01 to 1, c = 0.01 to 1 and d = 0.01 to 1;

- (b) admixing a seeding effective amount of an orthorhombic phase mixed metal oxide seed, substantially free of hexagonal phase mixed metal oxide, with said solution to form a seeded solution,
- (c) removing said at least one solvent from said seeded solution to form a catalyst precursor; and
calcining said catalyst precursor to obtain said orthorhombic phase mixed metal oxide catalyst.